

What is claimed is:

1. A method of forming a floating gate in a flash memory device, comprising the steps of:

5 forming a tunnel oxide film and a first polysilicon film on a semiconductor substrate;

etching given regions of the first polysilicon film and the tunnel oxide film and then etching the exposed semiconductor substrate by a given depth, thus forming a trench;

10 forming an oxide film on the entire structure so that the trench is buried, and then polishing the oxide film to form an isolation film;

decomposing a native oxide film grown on the first polysilicon film, implementing an anneal process to outgas the decomposed material, and then forming a second polysilicon film; and

15 patterning the second polysilicon film and the first polysilicon film to form a floating gate.

2. The method as claimed in claim 1, further comprising the step of cleaning the surface of the first polysilicon film using a HF solution, a
20 diluted HF solution or RCA after the isolation film is formed.

3. The method as claimed in claim 1, wherein decomposition of the native oxide film is to decompose SiH_4 and SiO_2 into Si and H_2 and Si and O_2 by introducing a SiH_4 gas of about 0.1 ~ 1.9SLM and reacting it for about 5

~ 20 minutes, in a state that the temperature and pressure of a reaction chamber are kept at 510 ~ 590°C and 200 ~ 600mTorr, respectively.

4. The method as claimed in claim 1, wherein the anneal process
5 is implemented by introducing a N₂ gas of about 0.1 ~ 1.9SLM and reacting it for 5 ~ 20minutes so that a H₂ gas and an O₂ gas react to a N₂ gas and are then outgassed, in a state that the temperature and pressure of a reaction chamber are kept at 750 ~ 950°C and 100 ~ 300mTorr, respectively.

10 5. The method as claimed in claim 1, wherein the second polysilicon film is formed by introducing a mixed gas of a SiH₄ gas and a PH₃ gas of about 0.5 ~ 2.0SLM and then reacting it for 20 ~ 40minutes, in a state that the temperature and pressure of a reaction chamber are kept at 510 ~ 590°C and 200 ~ 600mTorr, respectively.